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Social Sciences and Humanities Research Council of Canada
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ON PHYSICAL EDUCATION.*

By Richard Timberg, G.D.

(Of Stockholm.)

Every observer of children and their ways must have been struck by the incessant and irrepressible greed of movement, which every healthy child exhibits. Except when sleeping, and possibly when eating, their natural impulse is to be constantly on the move. So true is this, that if a child become very steady and quiet, one has good reason to suspect that it is out of health. To keep still, and especially to *sit* still, is otherwise almost an impossibility, and this must not be attributed to the restless and troublesome disposition of the little individual, that ought to be checked. It is the nature of the child, and moreover a necessity for it, owing to the rapid changes taking place in the young body during the period of growth, and which cannot proceed satisfactorily without exercise. For it is the use of the body that makes it grow and develop. This is mainly due to the all-important fact that the blood vessels of any organ or part of the body, in activity, get dilated; an increased inflow of blood, that is of nourishment, thus being caused to the part in question. A more powerful circulation is brought about in the first place in the muscles actually at work, but also indirectly in the whole system of blood vessels. In the active muscles a more lively assimilation of the nourishment, thus freely supplied, takes place, and the combustion of waste and reserve products goes on at a more rapid rate, generating a greater amount of heat. Hence the healthy glow throughout the body, which experience tells us is obtained, when we feel chilly, by a few sharp and energetic movements such as beating the arms across the chest (the cab-driver's fire, I think it is called), or taking a short run. This increased

* Read before the Reading Branch of Parents National Educational Union.

combustion necessitates a greater supply of oxygen, which, as we know, has been taken by the blood from the air in the lungs. One consequence of bodily exertions will therefore be to cause quicker and stronger breathings to correspond to this greater demand.

It is, however, not our muscles alone that are interested in our bodily movements. The bones serve as levers for the muscles to act upon, and the nervous system is involved. It is therefore not only the muscles that profit by our bodily exercise, but also the bones, the nerves and even the cells of our brain do so in a degree by our simplest voluntary movement, because of the richer supply of nourishing blood to all the parts that are brought into activity. That this is a real gain even to our nervous system, is proved by the fact that complicated movements, which in the beginning can be performed only very deliberately and with difficulty, by practice, become perfectly easy and natural. Walking, for instance, is a very complicated movement, which at first requires a great deal of thought and labour, but in time becomes so easy that we long ago have forgotten that it ever gave us any trouble. On the other hand, a great many of us will remember our first try on a bicycle—how we struggled to keep the balance and to keep the pedals going; and how in covering some few hundred yards, we expended an amount of force that would be sufficient to carry us several miles now, when the act is once "organically registered in our brain," and has become automatic instead of being performed with effort and by conscious will.

Inactivity, on the other hand, has quite a contrary effect on the human body. This is most easily noticed with regard to the muscular tissue which soon becomes bloodless, fatty, and wasted, if kept disused. It is nothing but the self-imposed, absolute inactivity, that makes the limbs of the Indian Fakir wither away, as in pious devotion he stands at the road side begging for alms. No! The human body is a machine, with the peculiar attribute that the more it is used, within reasonable limits, the stronger and more capable it becomes. But if exercise plays such an important part in the maintenance of the once developed organism, we can easily understand that it must be still more essential to the rapidly growing individual. Thus we see that the infant is

only unconsciously working to forward its own development, when from a very early age, it begins instinctively to take the exercise which is so necessary for it; until, in some years' time, it has acquired what is somewhat approaching to the art of perpetual movement.

However, unfortunately for the development of what might be a very strong and healthy savage, these tendencies in the children cannot, in our civilised times, be allowed to go on for ever. The young citizen will in due time be sent to school, and this means a revolution in its life in more senses than one. From freedom the children are suddenly brought under discipline and restraint, they are placed on forms and told to "sit still," an order that is obeyed only with the greatest difficulty, as every teacher knows only too well. We can easily understand that this restraint must be irksome to them, after the perfect freedom they have been accustomed to enjoy; and to my mind one of the greatest advantages of the kindergarten is to mitigate the suddenness of this change, leaving alone its great value in other respects. But not only is it irksome: the lack of that exercise which we have seen to be such a necessity to the child, is downright injurious to it. Nor is this negative danger of the enforced sedentary life the only one. There are also other more positive dangers that threaten the frail youngster, by its being placed on the school bench, and that is through the bad positions which the pupils are so liable to occupy, and for some length of time to retain on the forms.

As a rule, children have a tendency to lean forward in the desks. If these be badly constructed, as is often the case, the evil is aggravated; but even with the most perfect desks the children will bend forward, and the more so the younger they are. The mechanism of breathing is impeded in its action by this leaning posture. The most important inspiratory muscle in the body is the diaphragm, the flat muscle, which divides the chest from the abdomen. In leaning forward the abdomen is compressed, and the movement of the diaphragm hindered, causing the act of inhalation to become less deep, and the whole breathing shallow and inefficient. But the way in which the breathing is performed is of great importance to the circulation. The action of the heart, as well as that of breathing, is disturbed, and the internal organs become over-

charged with sluggishly-flowing blood to the detriment of their activity.

Certain well-known disturbances soon manifest themselves in the health of school children through the above-mentioned influences. Headaches often occur. They arise as a natural consequence of the congested state of the brain during study, brought on by the almost exclusive activity of that organ, in conjunction with the above-mentioned obstacles to a free flow of blood through the veins.

The development of the organs of breathing receives a marked check from the lack of bodily exercise. When during the years of growth, day after day for hours at a stretch, the act of breathing is performed with subdued power, superficially and feebly, without a full expansion of the lungs and chest, a poor development of these organs ensues, resulting in a flat, sunken and immobile chest. This is a sign of weakness in those parts, which may even indicate a tendency to lung diseases. The sluggish circulation through the abdominal organs, caused by their compressed condition, when the body is continually bent forward, is, no doubt, very often solely responsible for many a school-child's persistent indigestion.

Curvatures of the spine arise as a consequence of these same conditions. Owing to the yielding and pliable state of the child's skeleton, and the very often poor muscular development at that age, the spinal curvatures, with all their attending evils, are a constantly menacing danger which has to be guarded against. It is particularly the children's position when writing that ought to be carefully watched, as bad or careless habits then are likely to cause the more serious kind of deformity of this class, that is the *lateral* curvatures. One great step forward in this respect has been made by the almost universal adoption in schools of the vertical hand writing, as this enables the pupil to sit straight facing his work, and with both his elbows equally supported on the table. Much depends also upon the construction of the school benches: and this fact being duly recognized, a great deal of attention has lately been paid to providing the most suitable school furniture. I know of one instance in Sweden, where before furnishing a new school, statistical particulars were gathered from all other similar schools in the country,

so that a true average might be obtained of the size and proportions of the pupils in the different forms, and the benches adapted accordingly. With such precautions the risk of the children acquiring spinal curvatures must naturally be greatly minimised; but still it exists. Besides the lateral curvature, there is also the by far more common *Kyphosis*, or what is generally known as "round shoulders." In this defect the upper part of the spine is curved to excess, the collar-bones and the shoulders stoop forward over a hollow chest, compensated by a protruding abdomen. The head is carried in that peculiar way, with the chin sticking out, which is called the "poking chin." All the features of a poor development of the chest are here present, and if at the same time, as very often happens, the individual, through adenoids blocking up his nose, or through sheer carelessness having acquired the inadmissible habit of breathing through the mouth—he is walking about with his mouth wide-gaping—perhaps on flat feet and with knocked knees, we have a very characteristic type, which in more or less aggravated form, alas, is far from rare amongst our youths.

In a few words: the physical inactivity of children during school life, coupled with the bad positions assumed by them on the forms, is liable to cause defects in their physical development, predisposing to serious disturbances in the health of the scholars. As, however, in mental education this forced inactivity for a certain time cannot be avoided, the obvious duty of every school is to provide suitable exercise for its pupils to counteract the evil and thus prevent them from suffering harm physically. Granted the necessity of Physical Education in the school, the means of attaining the same remain to be considered. Outdoor games and sports provide excellent opportunities for physical development (not to mention their great beneficial influence on the formation of character), and England may justly be proud of holding the first place among all countries with regard to them. They occupy a very conspicuous position in the daily routine of most English schools in their various forms, from such simple pursuits as the game of "touch," and performances with the hoop and skipping rope, to the great national games of cricket and football. I do not mean to enter into any comparisons between the respective values of these different

pastimes. They are all good when played in moderation, and under suitable conditions. But there are in all of them certain weak points, which render them unsatisfactory as exclusive means of Physical Education.

One great drawback of all games of competition is their tendency to encourage those who from the beginning are strong and proficient, at the expense of the weaker individuals. For those on the other hand, that excel in one or other of these various games or sports, there is another danger threatening, that of *one-sided* development. As a striking example of this, let us take a foil fencer, who always handles his weapon with the right hand and lunges with the right foot. In time the muscles on the right side of his body become considerably larger and stronger than those on the left, the spine acquires a lateral curvature, and a marked difference between the two sides of his chest is apparent. So well known is this, that the masters of the art used to glory in this defect, and often in their portraits had the dissimilarity of the two sides of the body carefully accentuated. Therefore, when fencing is not practised with a possible view of duelling, as in France, in which case an exclusive perfection of one hand may be the most advantageous, equal attention ought always to be given to both hands. Thus practised, fencing forms one of the most admirable exercises.

However, the foil fencer, as described above, serves as a very clear example of one-sided development in the literal sense of the word, that is in contrast to *ambidextrous*. But I take the expression also in a wider meaning, not only so that the difference is between the right and left side of the body, but also when any one part of the body, or a particular group of muscles, is developed out of proportions to the other that is in contrast to *harmonious*.

An example of this kind of one-sidedness is furnished by the injudicious bicyclist, with an enormous development of legs, and an equally marked neglect of the rest of the body. With crooked back and sunken chest he works his way along, panting for breath, oblivious of everything except speed. The result is often a permanent injury to the heart through overstraining, and always a bad position of the body, retained even off the machine.

In the opposite way does the professional "gymnast"

succeed in deforming his body. By always exercising his arm and shoulder muscles in constant and almost exclusive practice on the parallel and horizontal bars, the trapeze or the rings, the upper part of the body becomes too heavily and coarsely developed compared with the lower. The chest muscles draw the collar-bones forward, the muscles on the back, both underneath and over the shoulder-blades, get thick and stiff, which prevents the free movement of the shoulders and arms, and in the end he resembles in appearance the weakly undeveloped person with his round shoulders and poking chin. The rapid increase in the girth of chest, which generally is pleaded in favour of ardent practice on gymnastic apparatus of the above-mentioned kind, is very often deceptive, being due to the development of the muscles, more than to an actual enlargement of the chest with increased capacity of the lungs.

These different types of one-sided development show their deformity plainly enough. But a man may look the very picture of health and strength, with every muscle developed to the utmost, and may moreover be able to show, by performing "feats of strength," that appearances are for once truthful. Some day, however, this very man, so strong and robust in appearance, is attacked by illness, breaks down, wastes away and dies in a short time. Simply another case of "one-sided development"; this time of the muscular system to the detriment and overstrain of internal organs. The heart particularly is liable to injury in this way, when its natural work in propelling the blood through the body is excessively increased by an abnormal mass of muscle that is repeatedly brought into a high degree of activity. To a certain extent the heart-muscle will, like other muscular tissue, profit by its increased function; but when tried beyond that, the consequence is overstrain and degeneration, and it must not be forgotten that in young people this limit is reached comparatively soon. Dr. Lander Brunton, speaking of the influence of muscular exertion upon the heart, says: "When the exertion is over-continued it may lead to permanent mischief. More especially is this the case in young growing boys, and it is not merely foolish, it is wicked, to insist upon boys engaging in games or contests which demand a long-continued over-exertion of the heart, such

as enforced races and paper chases extending over several miles."*

These are telling examples which occur every day. At the same time it must be understood that these various modes of exercise are not to be decried—be it fencing, bicycling, trapeze or bar-practice—nor must it be forgotten that many derive great benefit from their pursuit. It is the *injudicious* use of them, when they are done for their own sake only and without any forethought as to their suitability for the system that becomes dangerous, and may lead, not only to a defective development of the body but even to injurious deformities.

(*To be continued.*)

* Harveian Oration, 1894.